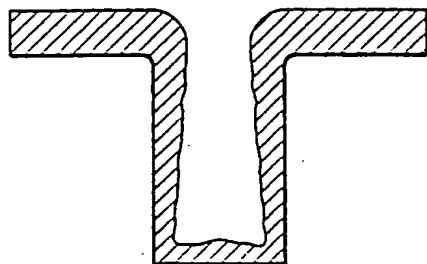


1 / 32

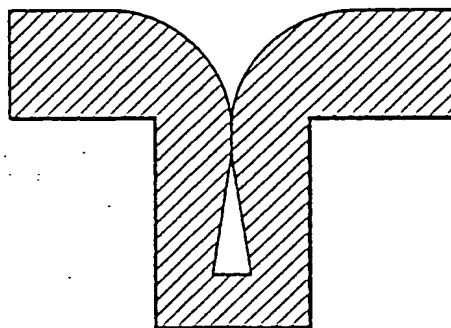
Fig. 1

Early Stages of Plating

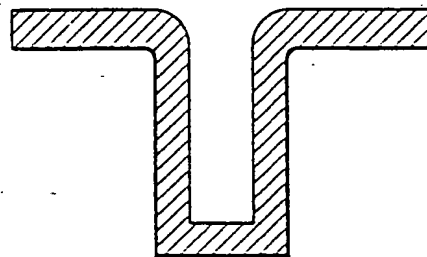
Late Stages of Plating



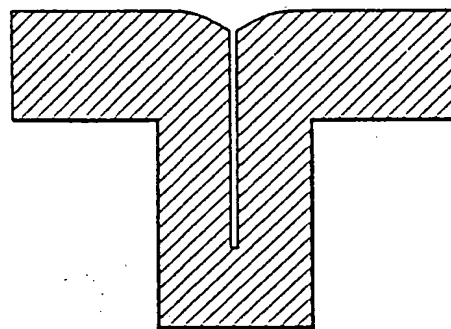
Anti-Conformal



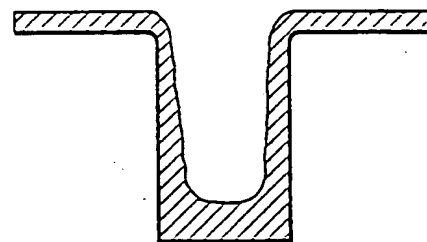
Void



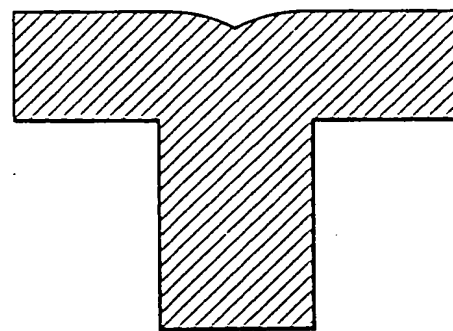
Conformal



Void



'Super-filling'

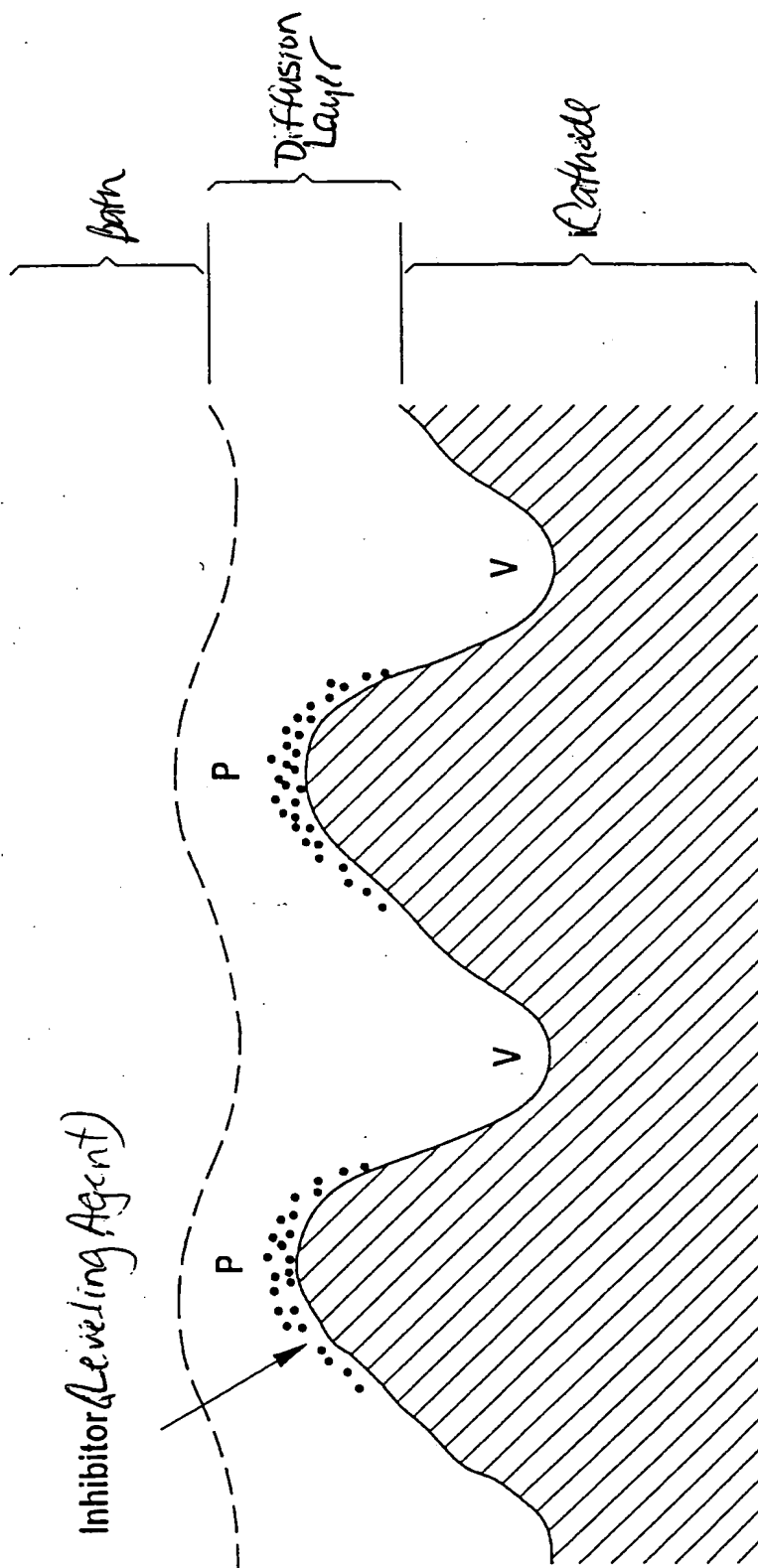


Defect-free

32pgs
42 bgs

2 / 32

Fig. 2

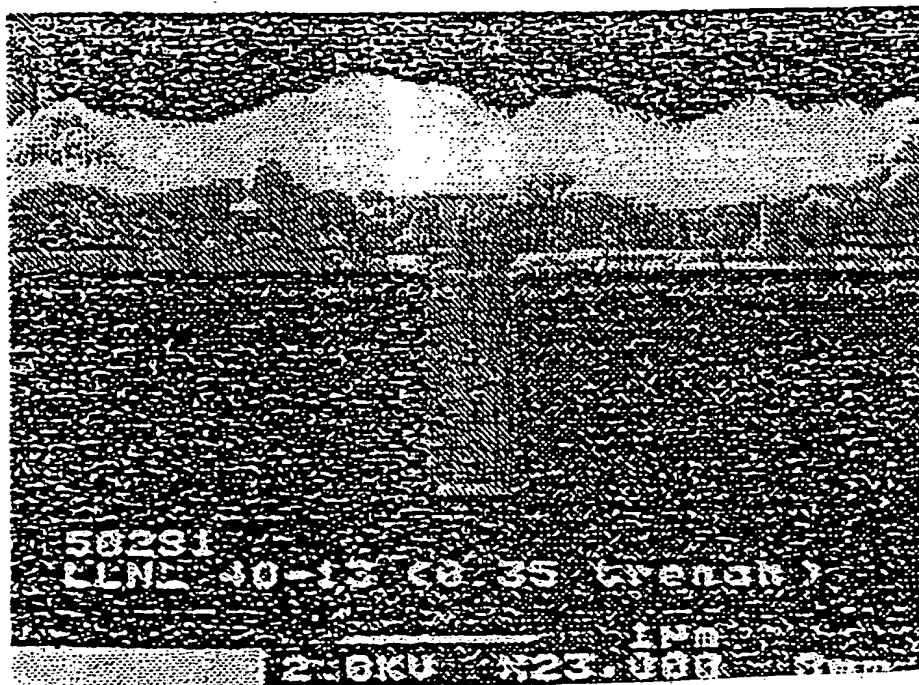


3 / 32

Fig. 3a



Fig. 3b



4/32

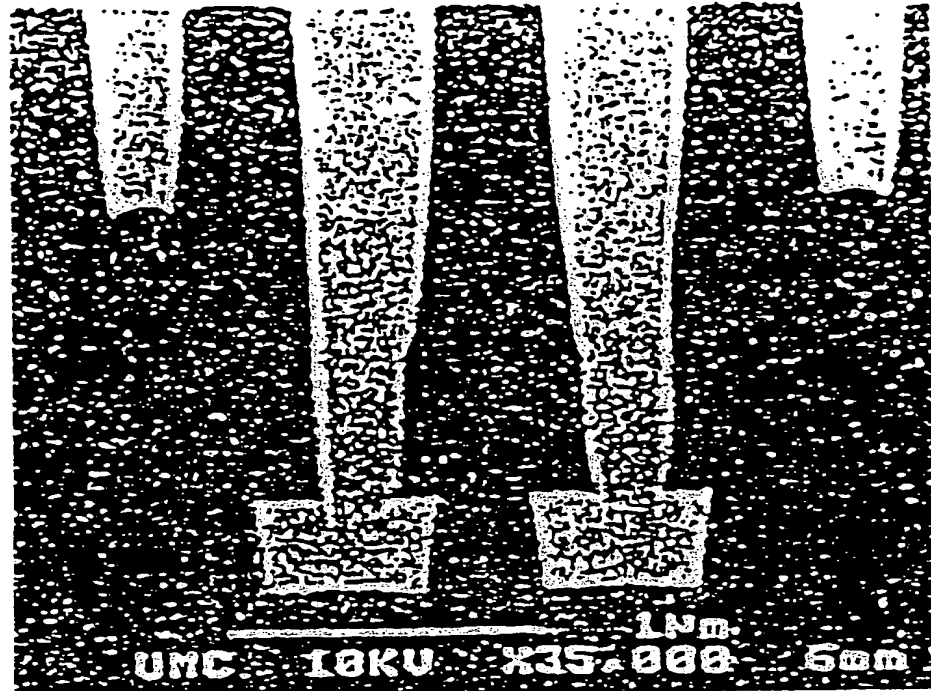
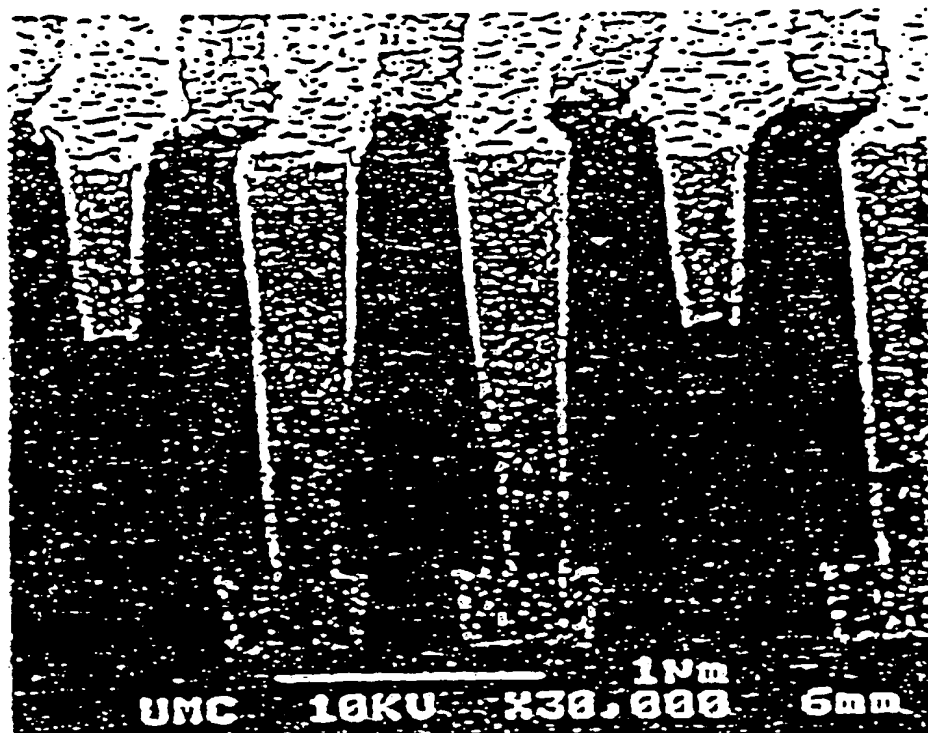


Fig. 4



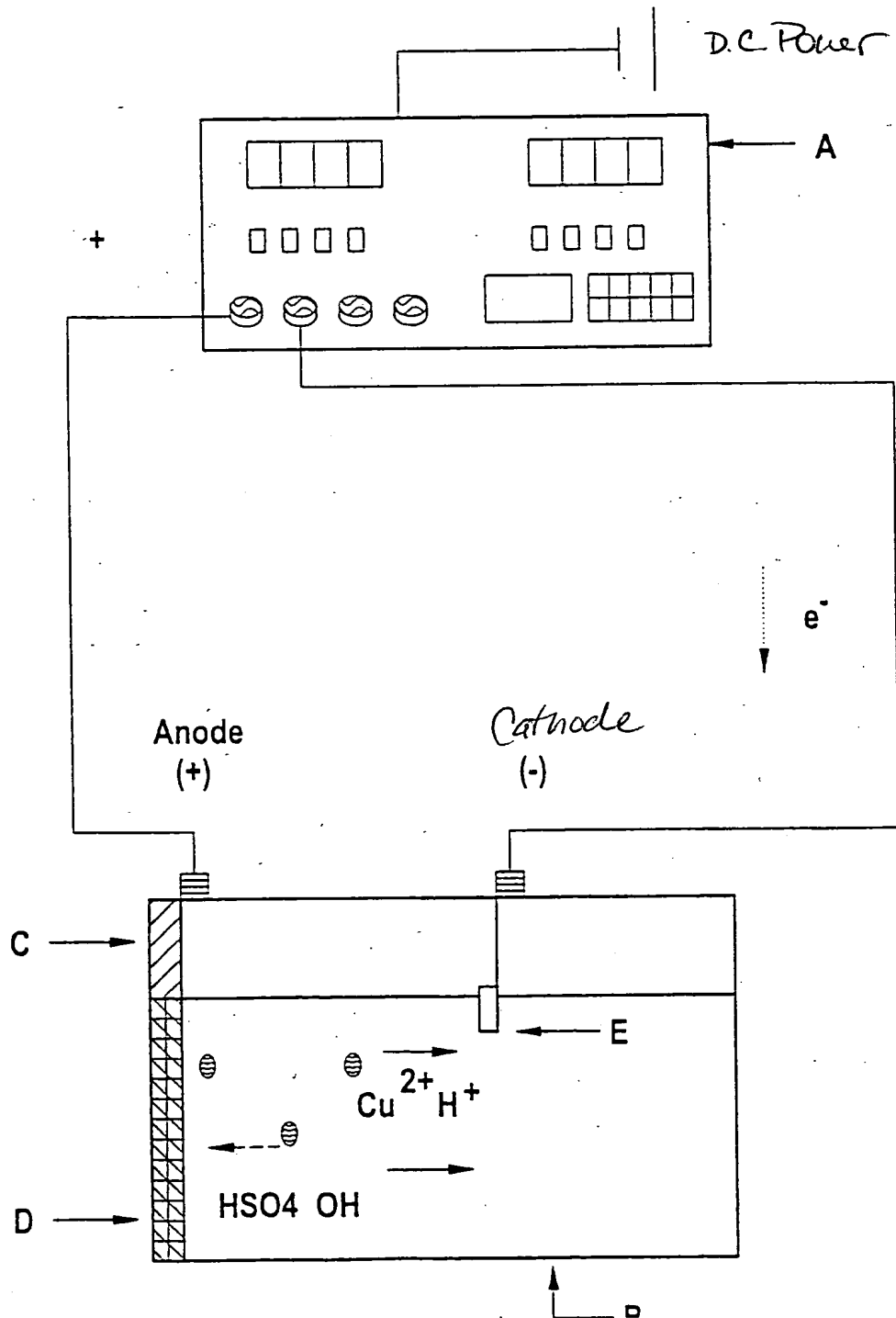
5/32

Fig. 5

A: Power Supplied
D: Packed Copper

B: PP Tank
E: Wafer

C: Ti - Anode Basket



6 / 32

Fig. 6

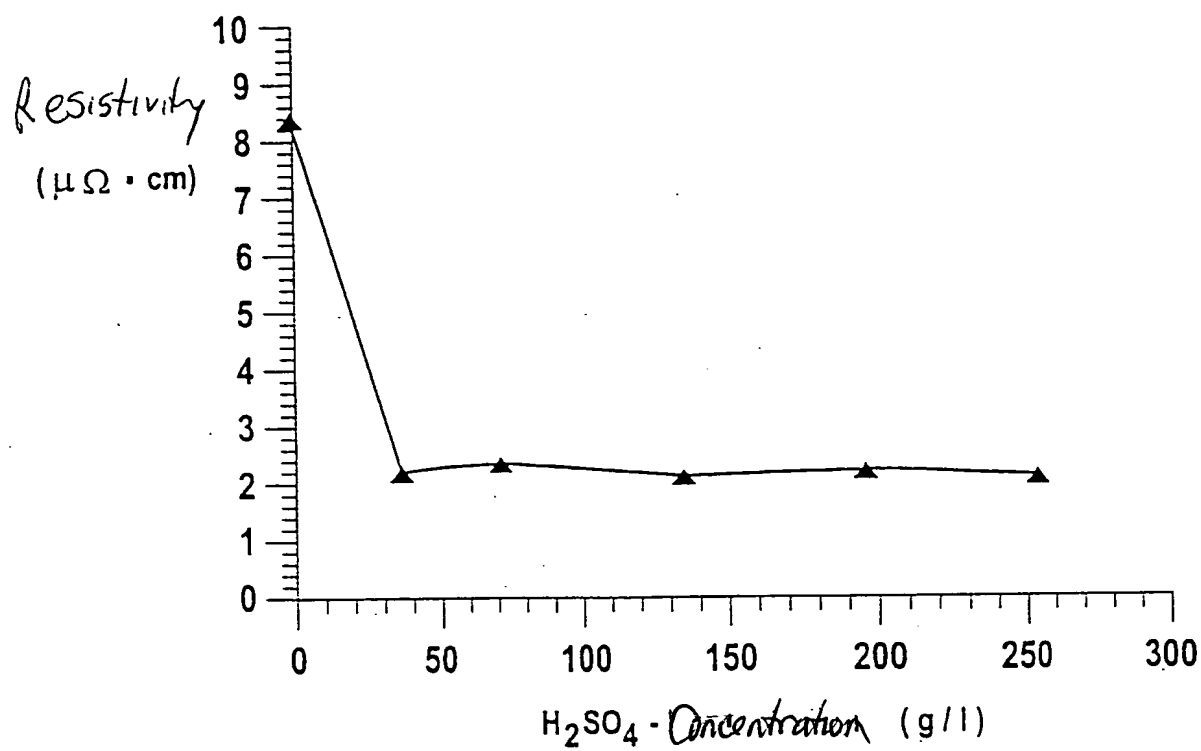
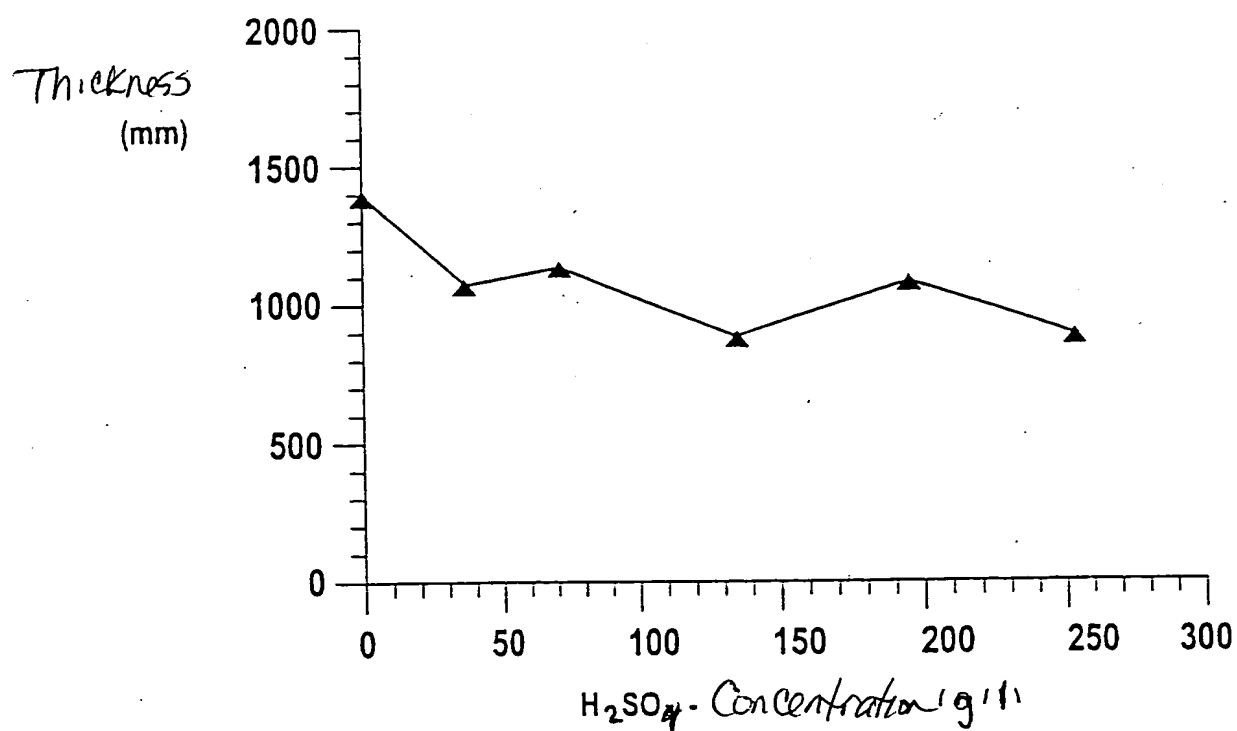


Fig. 7



7/32

Fig. 8a

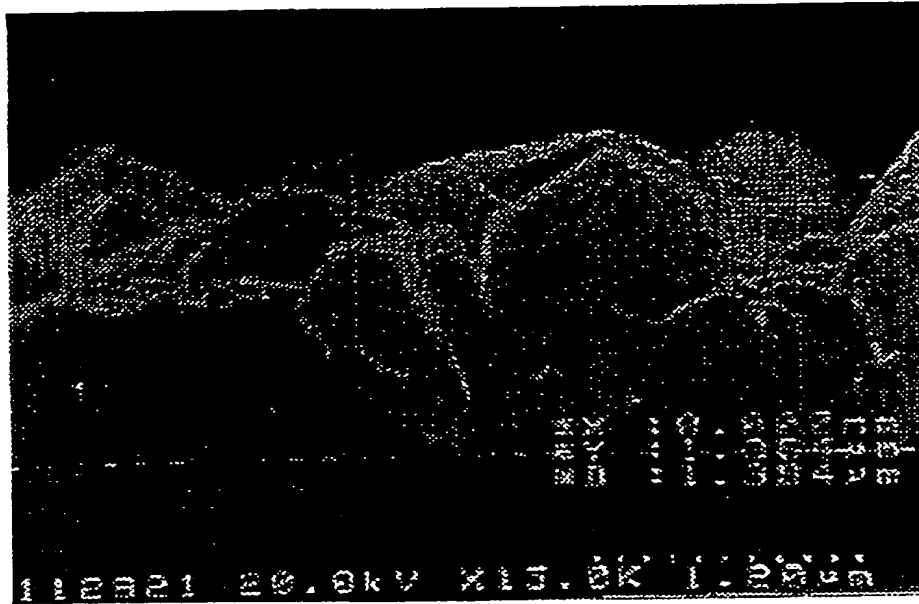
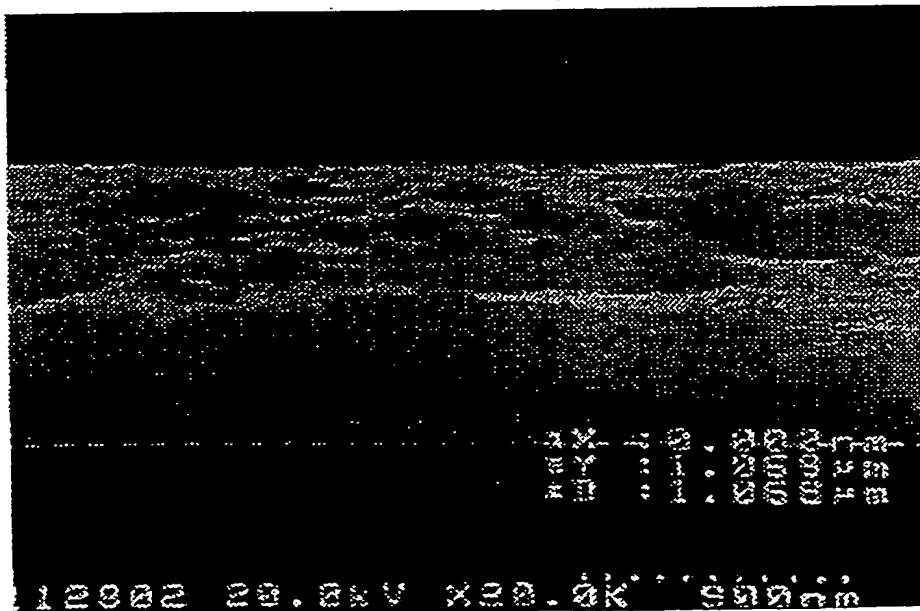


Fig. 8b



8 / 32

Fig. 9

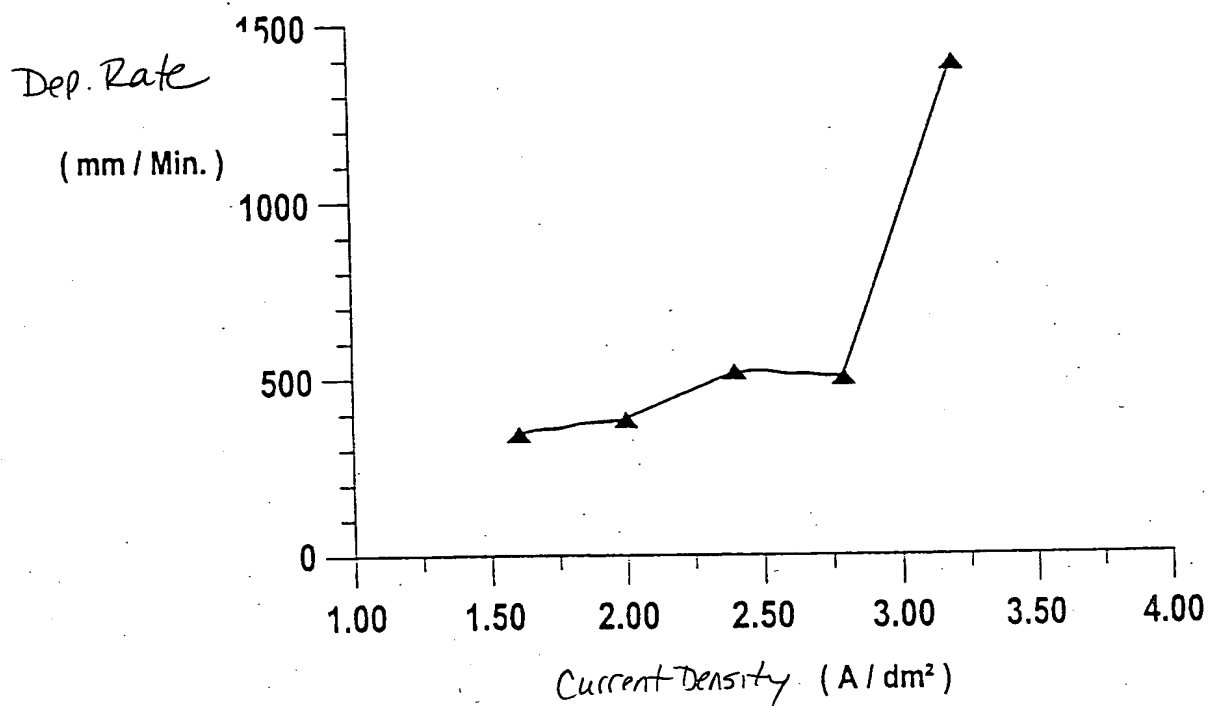
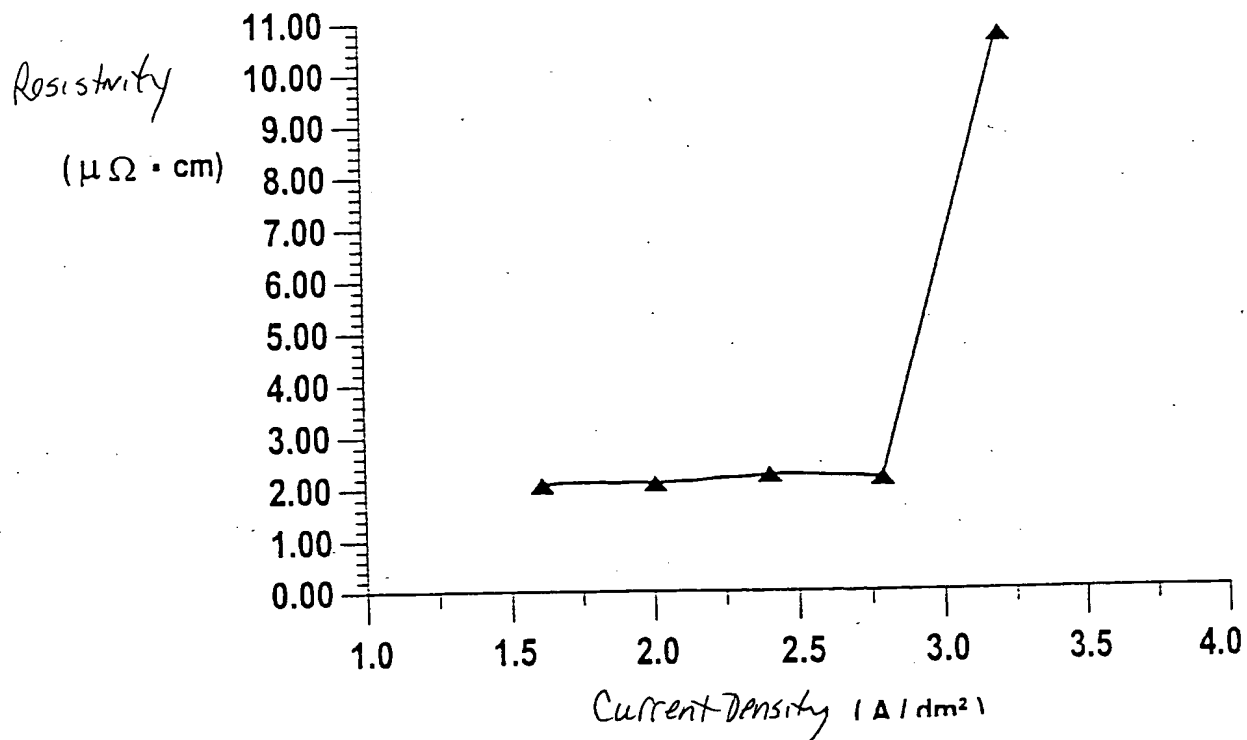


Fig. 10



9/32

Fig. 11a

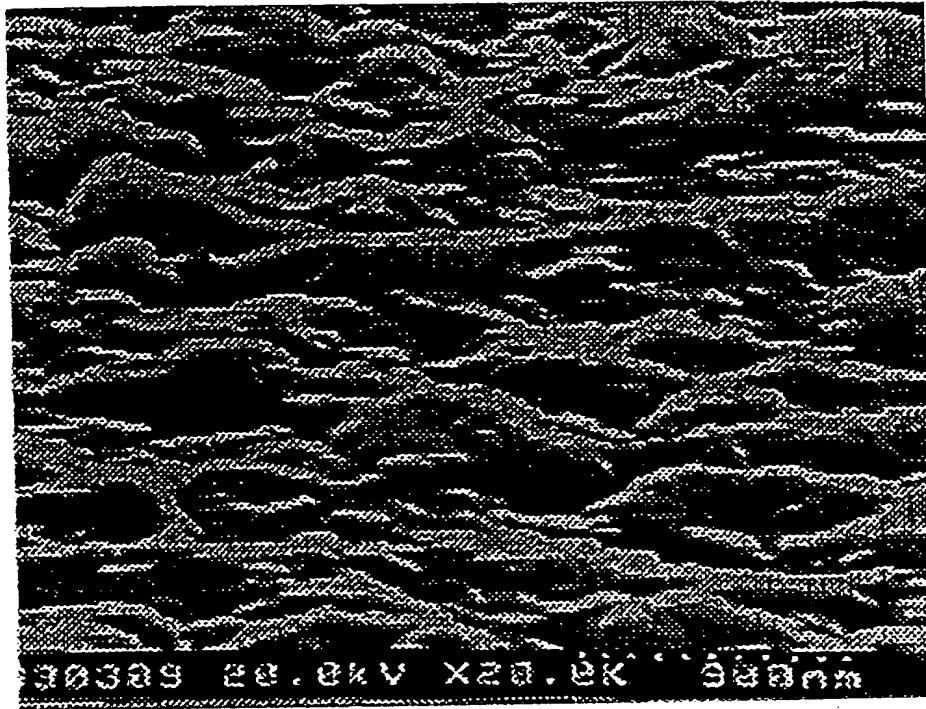
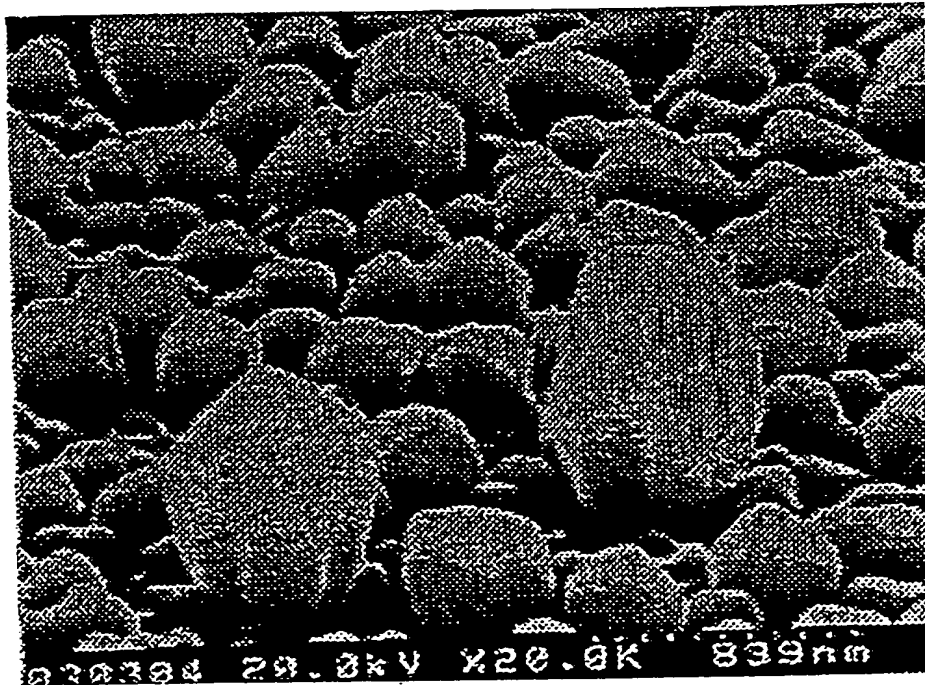
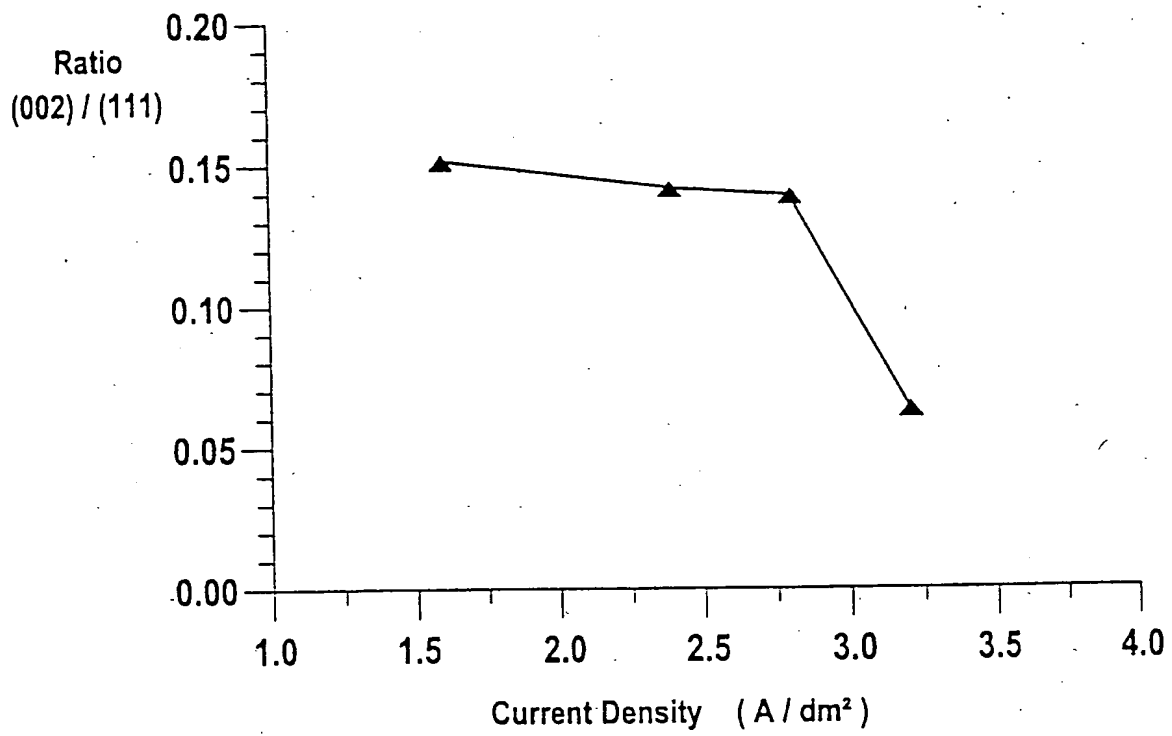
1.2 A/dm²

Fig. 11b

3.2 A/dm²

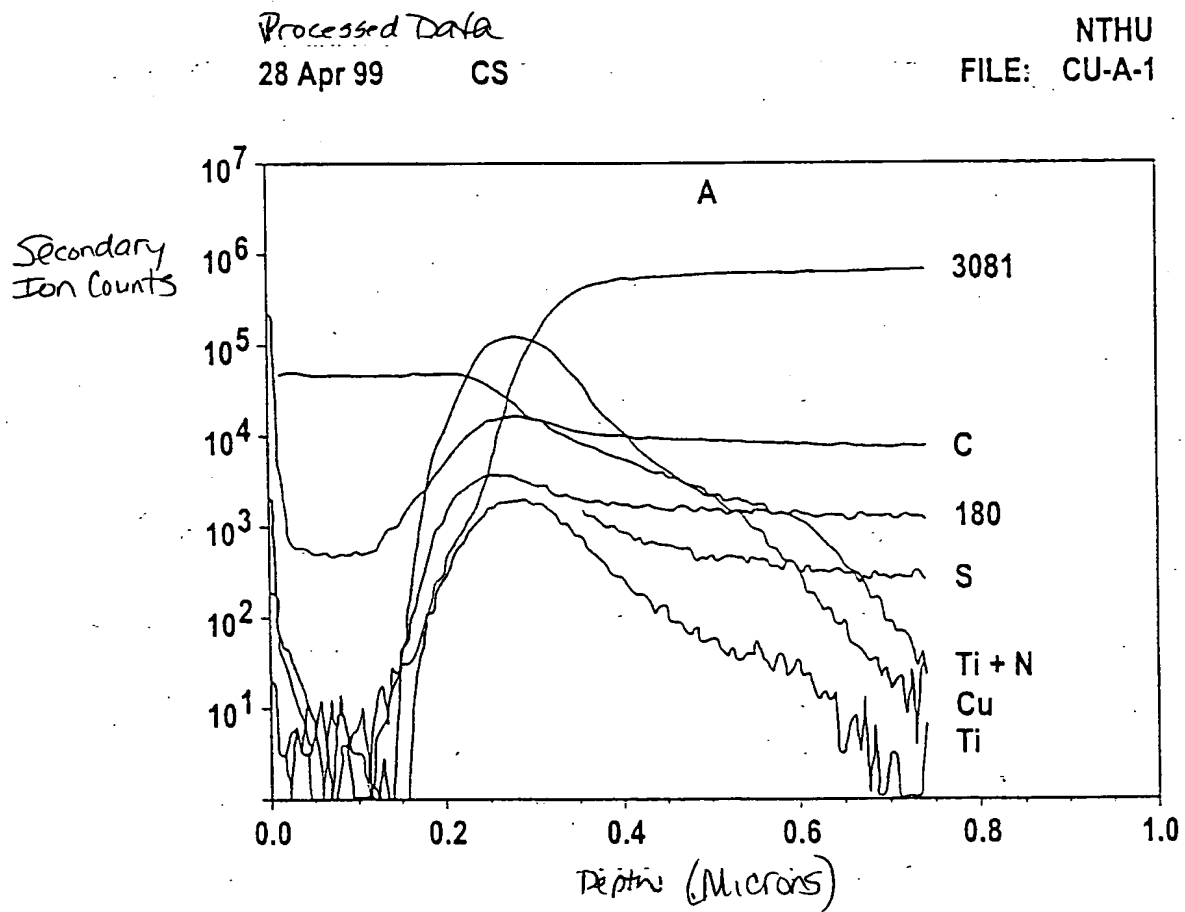
10 / 32

Fig. 12



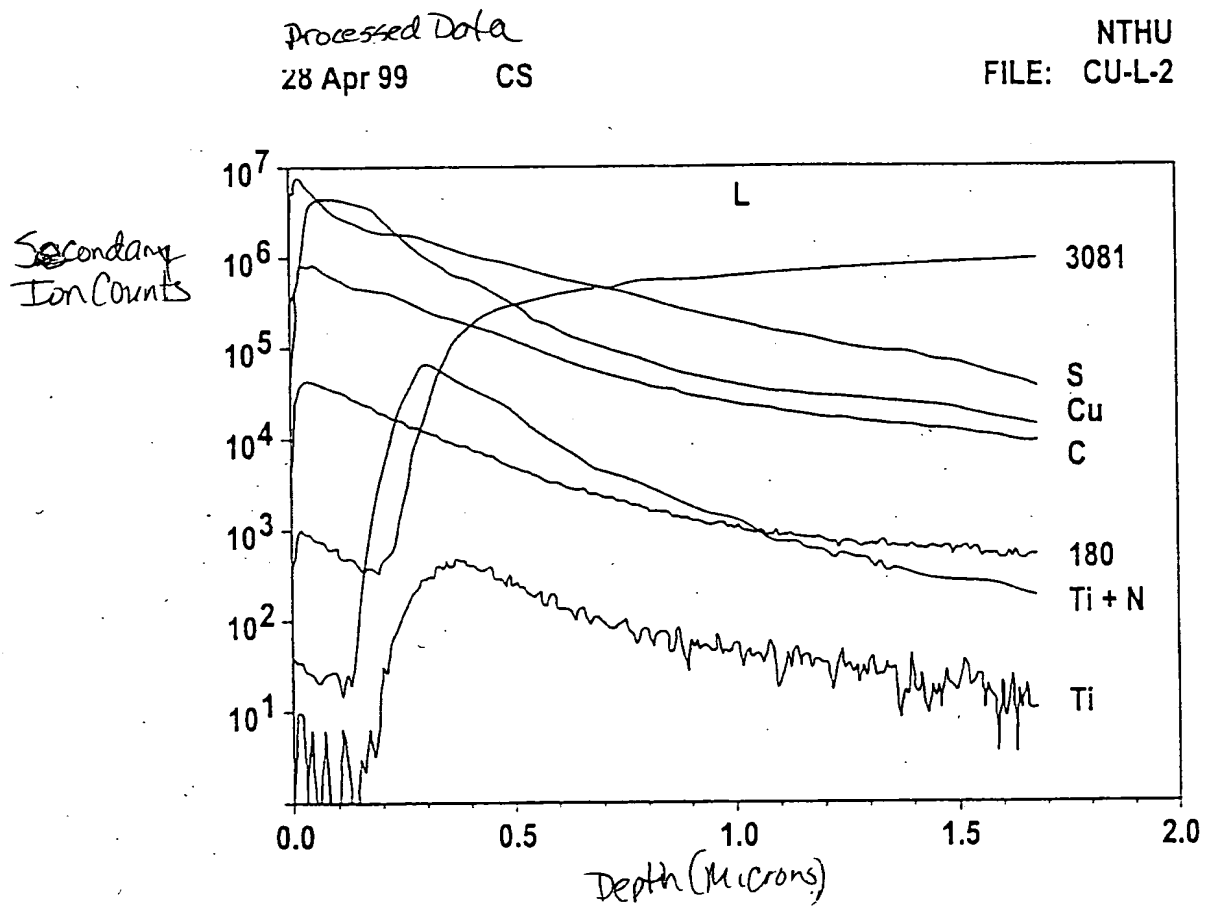
11 / 32

Fig. 13a



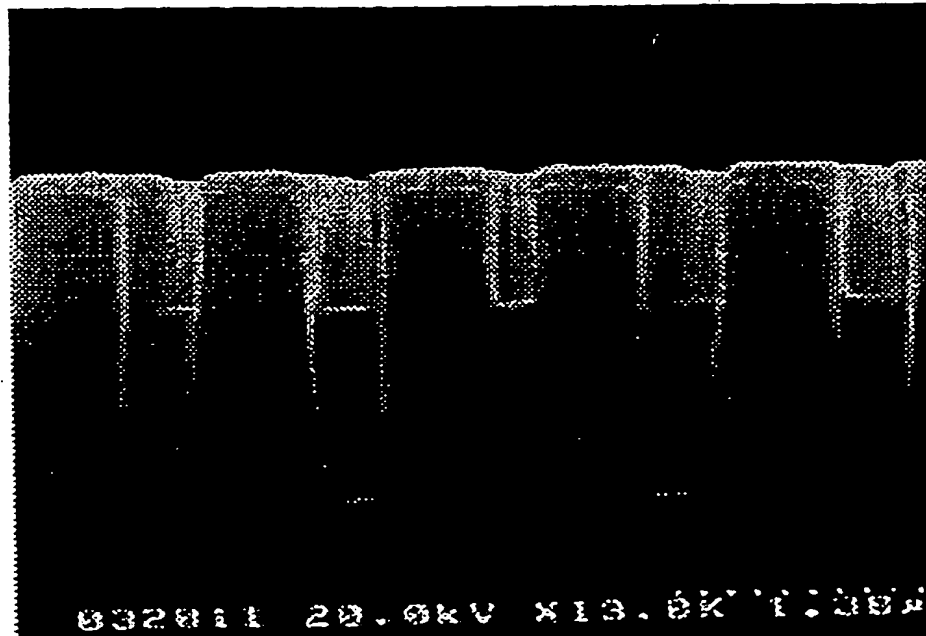
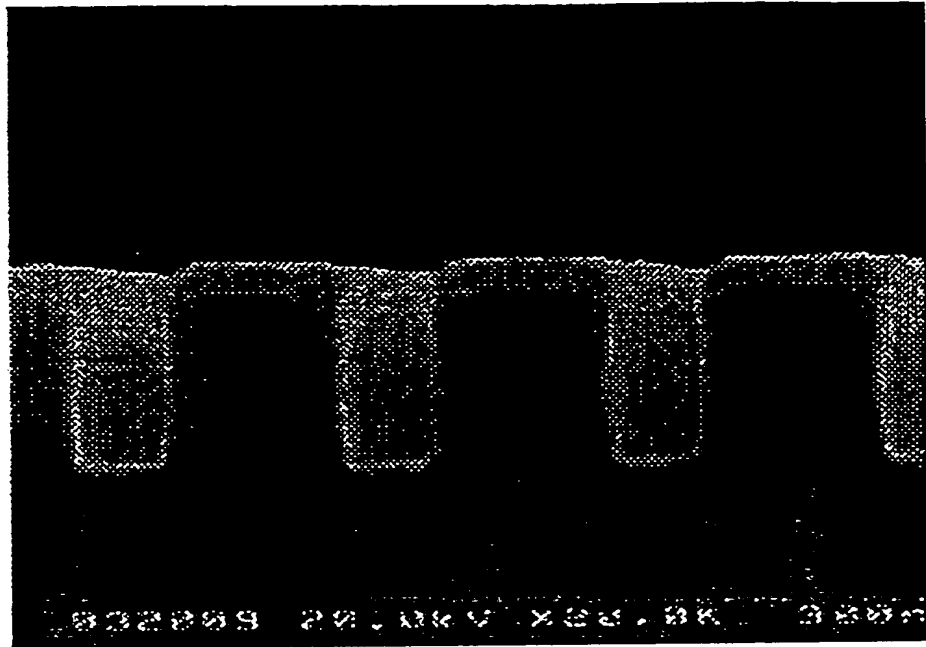
12 / 32

Fig. 13b



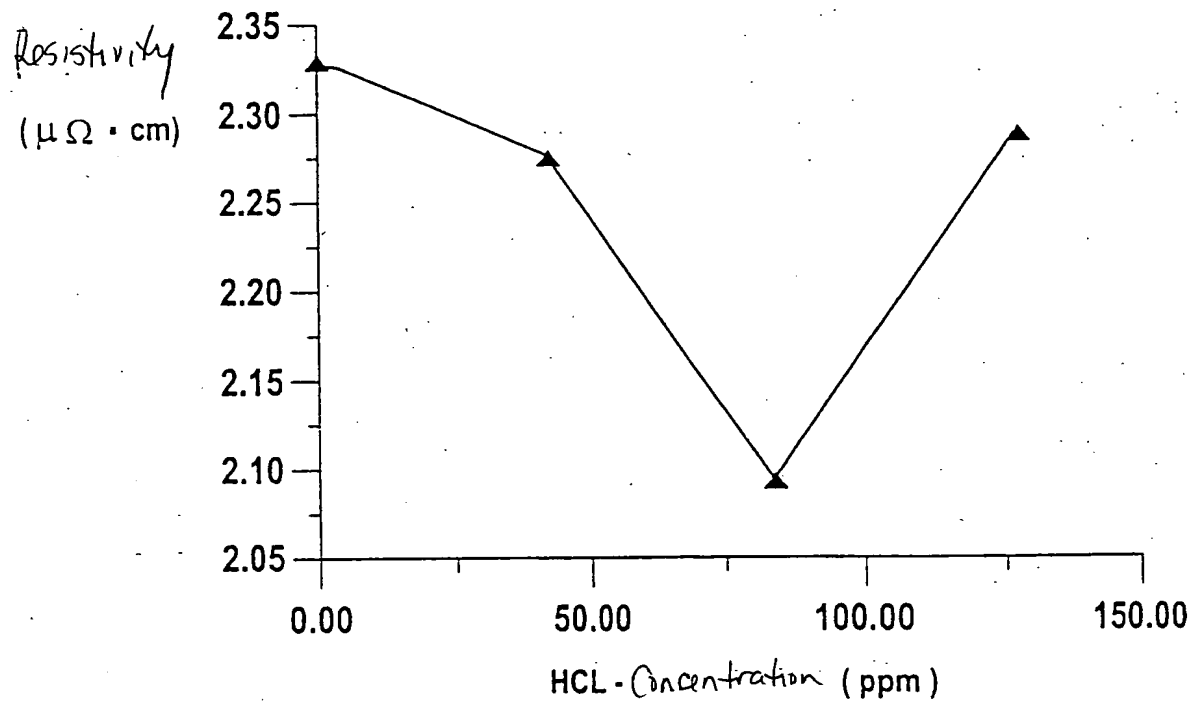
13/32

Fig. 14



14 / 32

Fig. 15



15 / 32

Fig. 16a

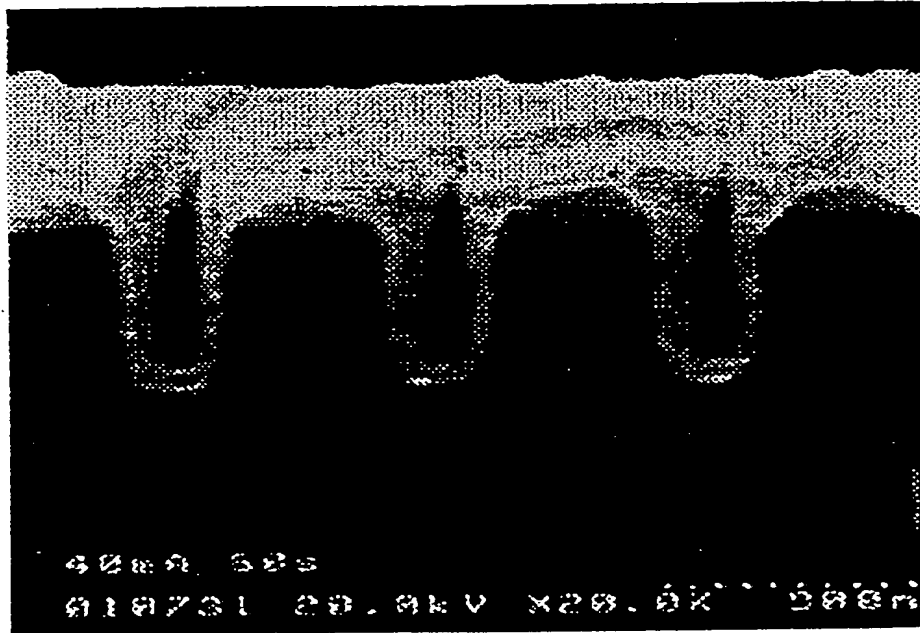
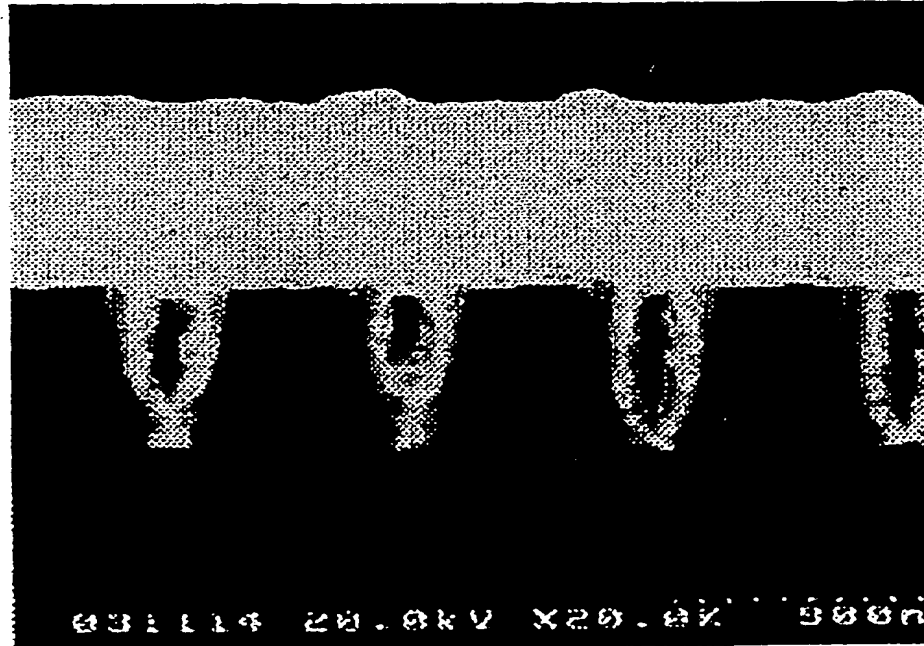
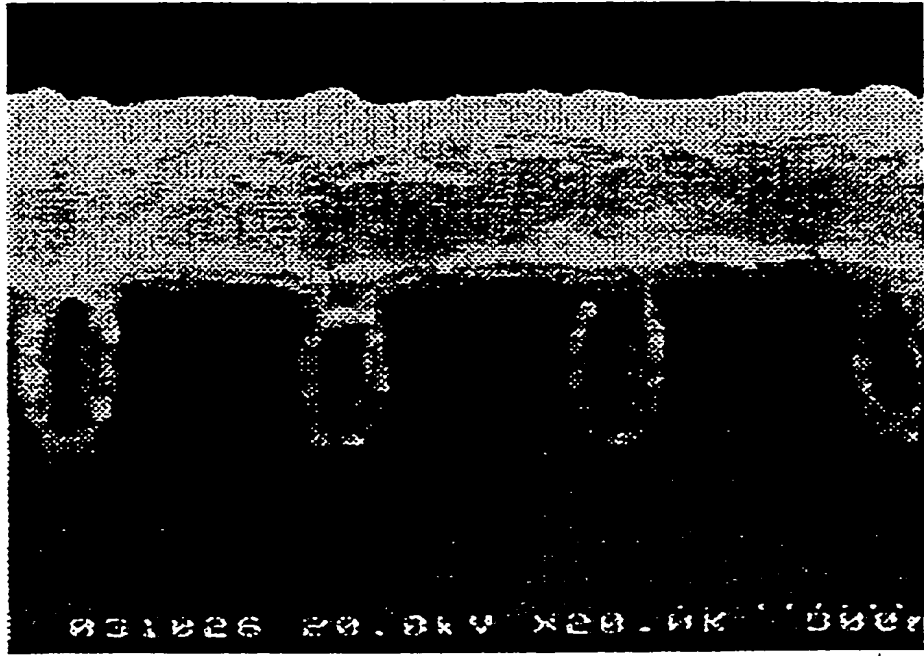


Fig. 16b



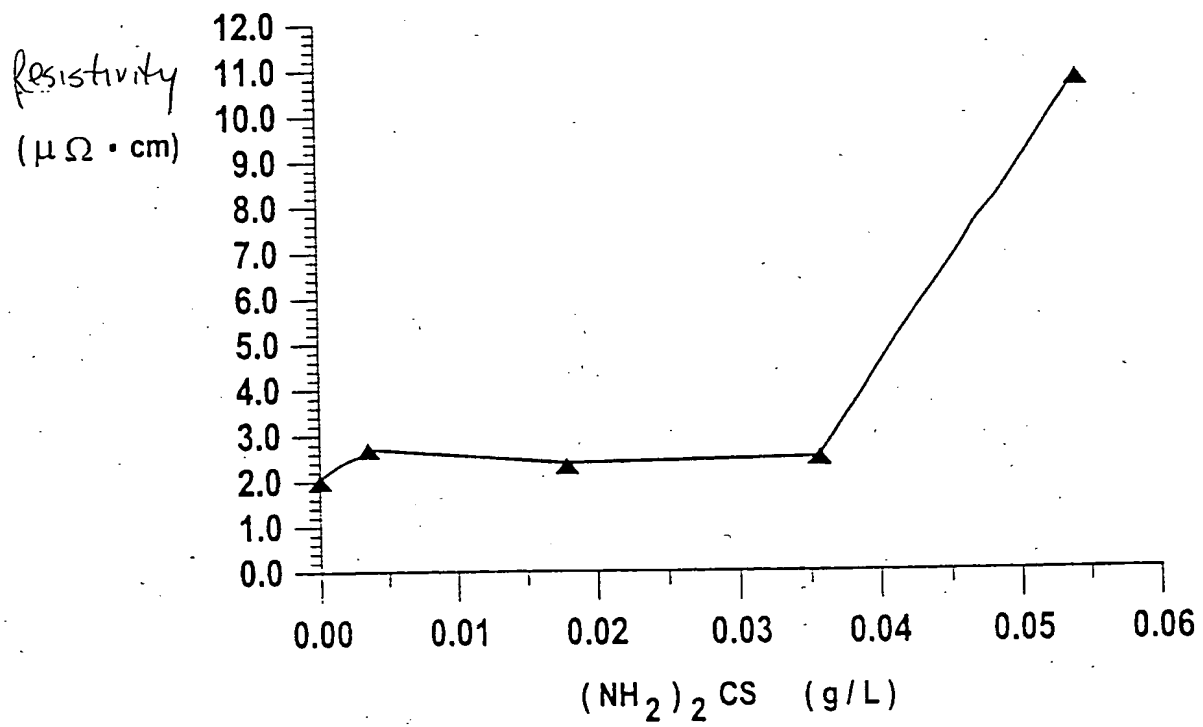
16 / 32

Fig. 17



17 / 32

Fig. 18



18/32

Fig. 19

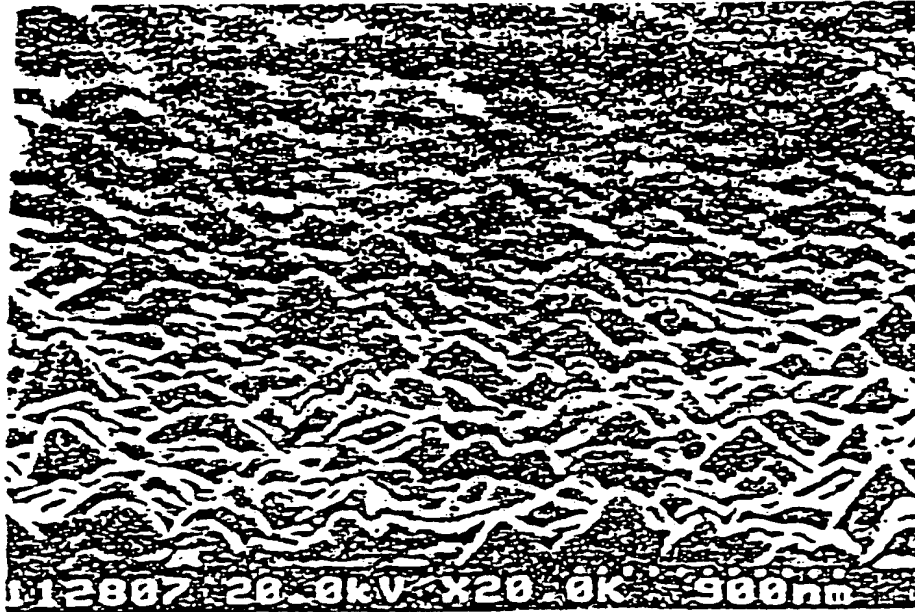
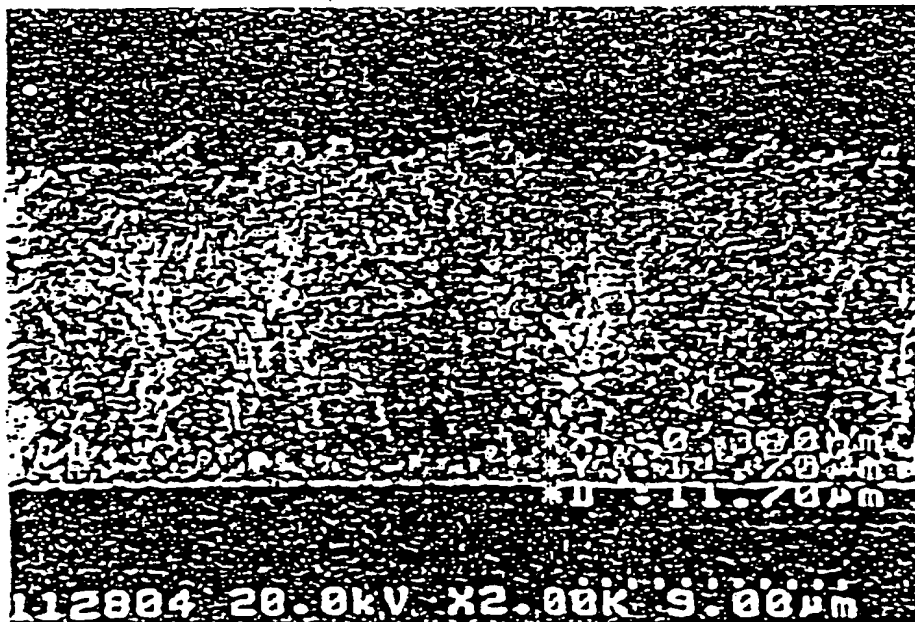
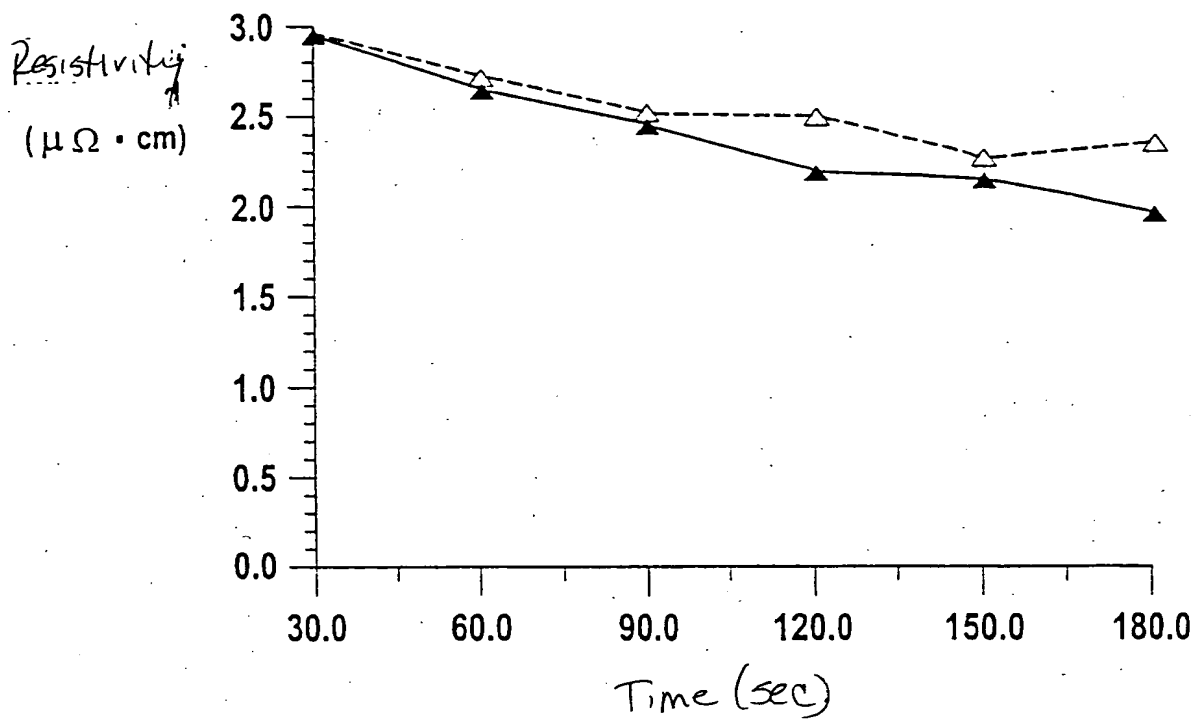


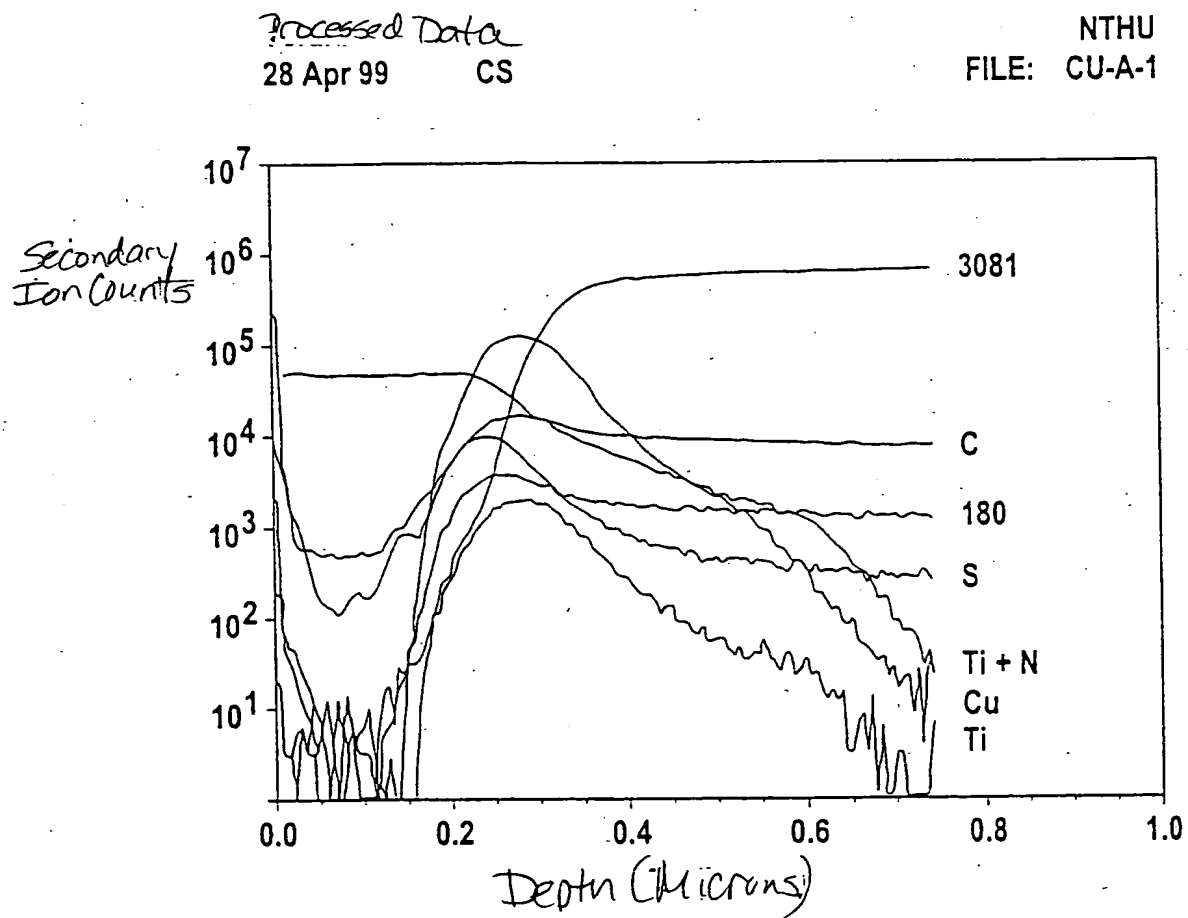
Fig. 20



19 / 32

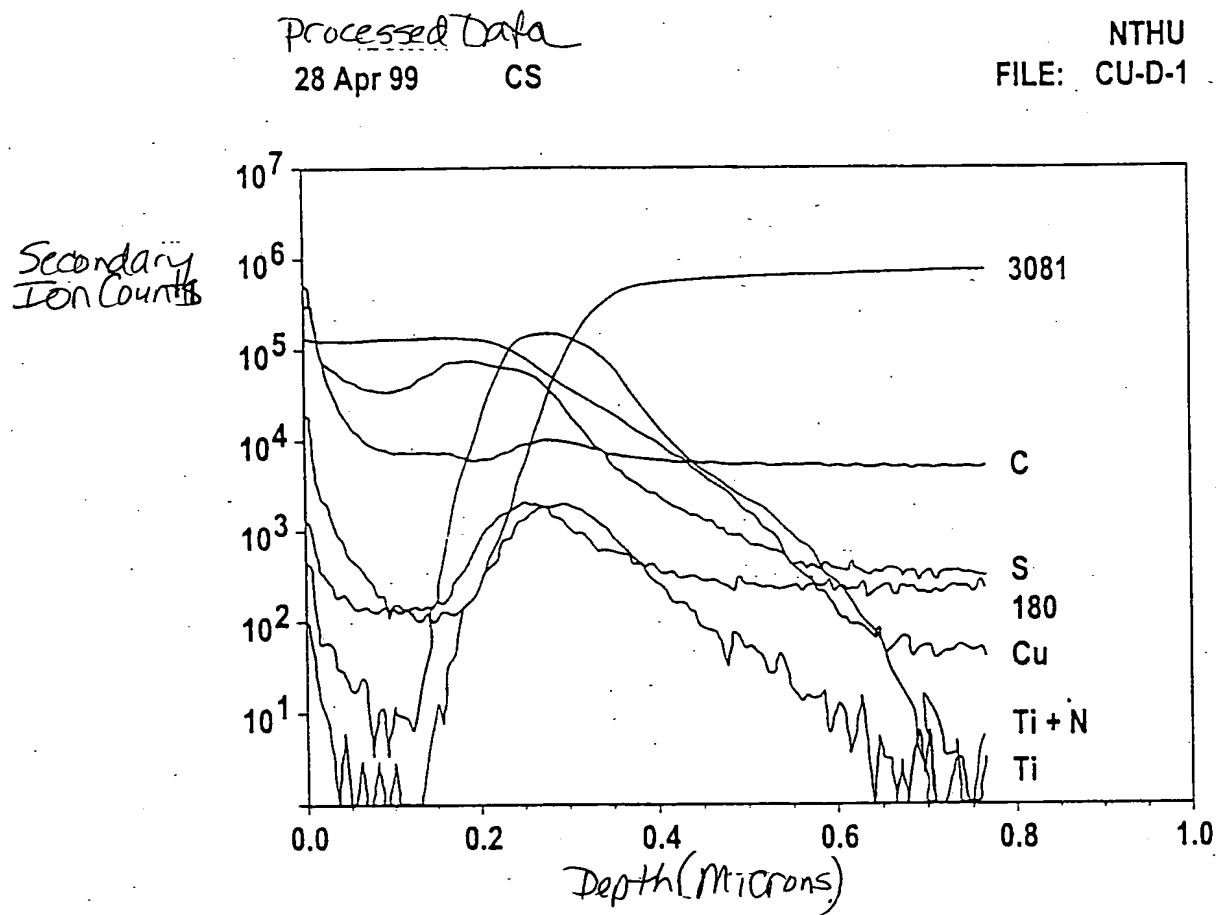
Fig. 21





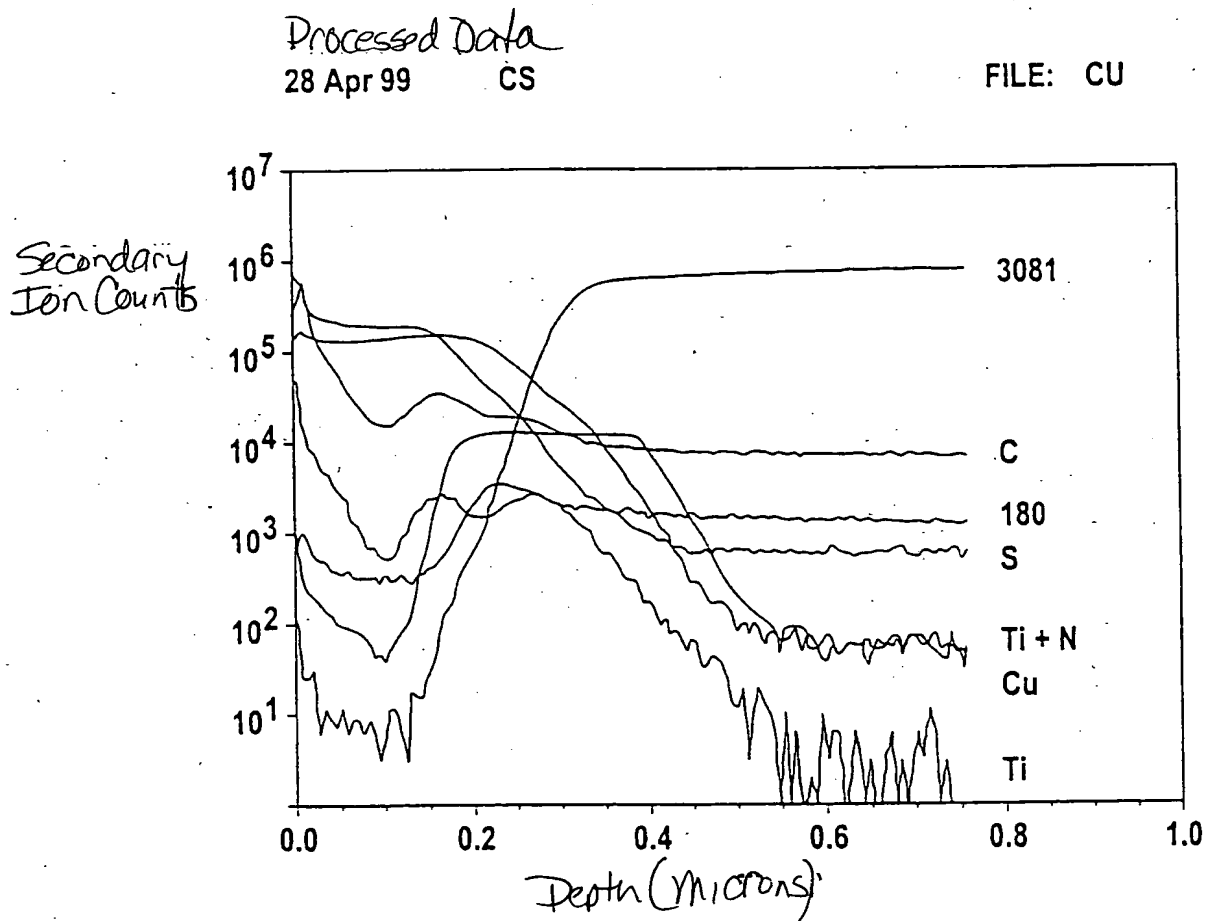
21 / 32

Fig. 22b



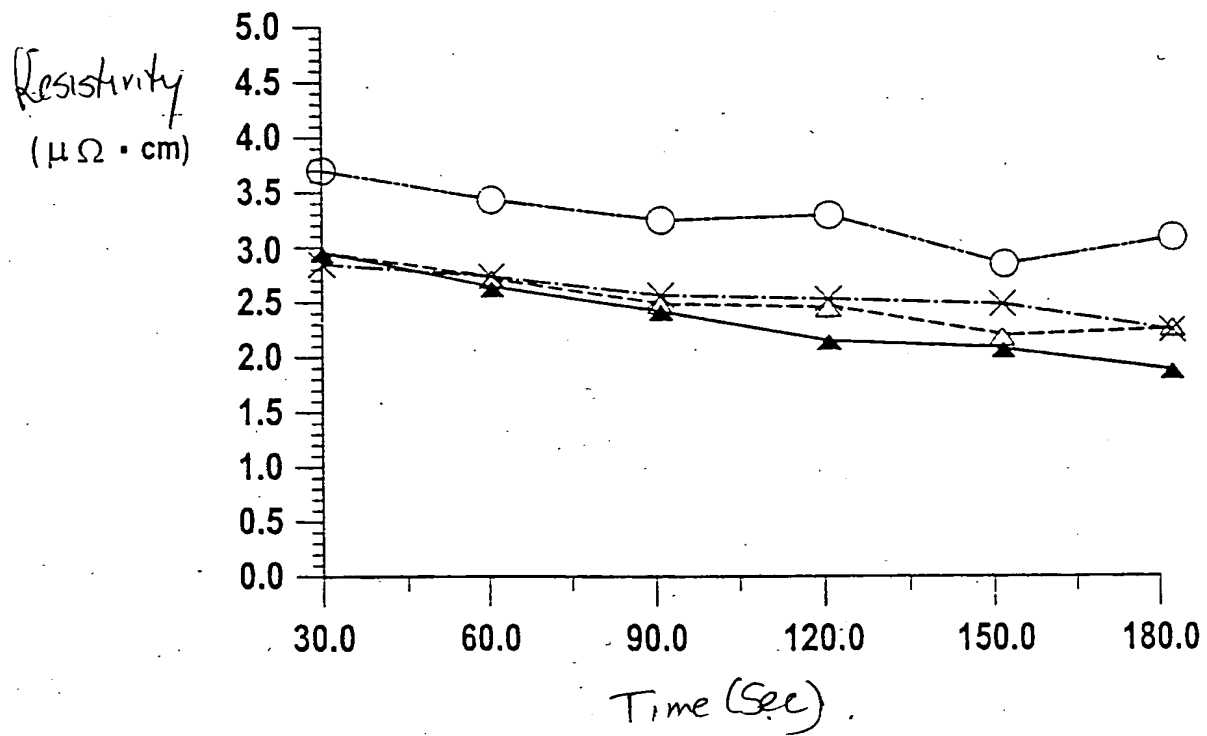
22 / 32

Fig. 22c



23 / 32

Fig. 23



- ▲ without additive agent
- △ 0,0036 g/L $(\text{NH}_2)_2$ CS und PEG200
- × 0,0036 g/L $(\text{NH}_2)_2$ CS und PEG1000
- 0,0036 g/L $(\text{NH}_2)_2$ CS und PEG4000

24 / 32

Fig. 24a

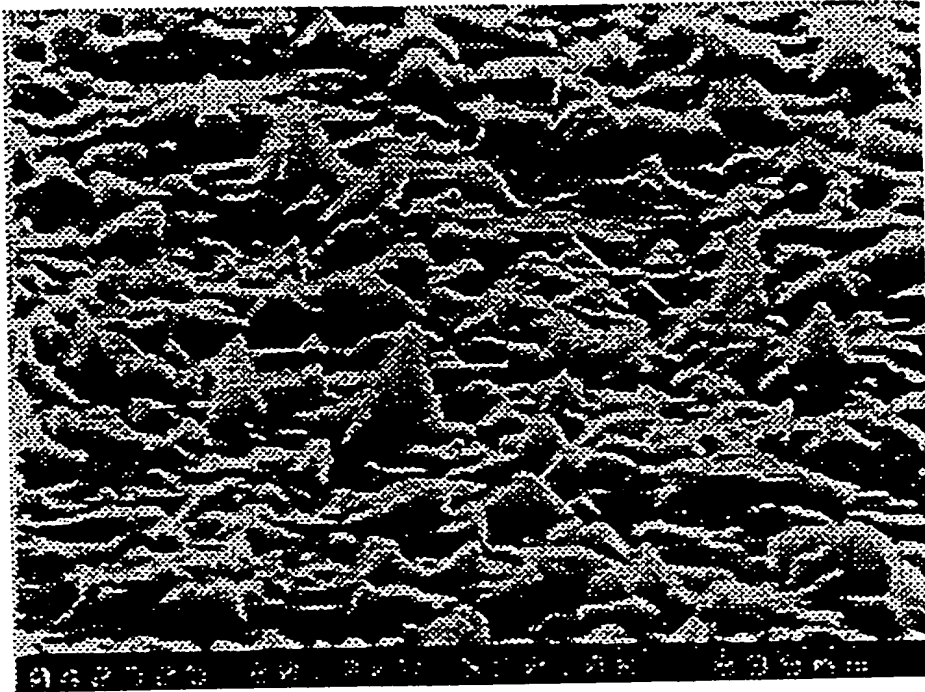
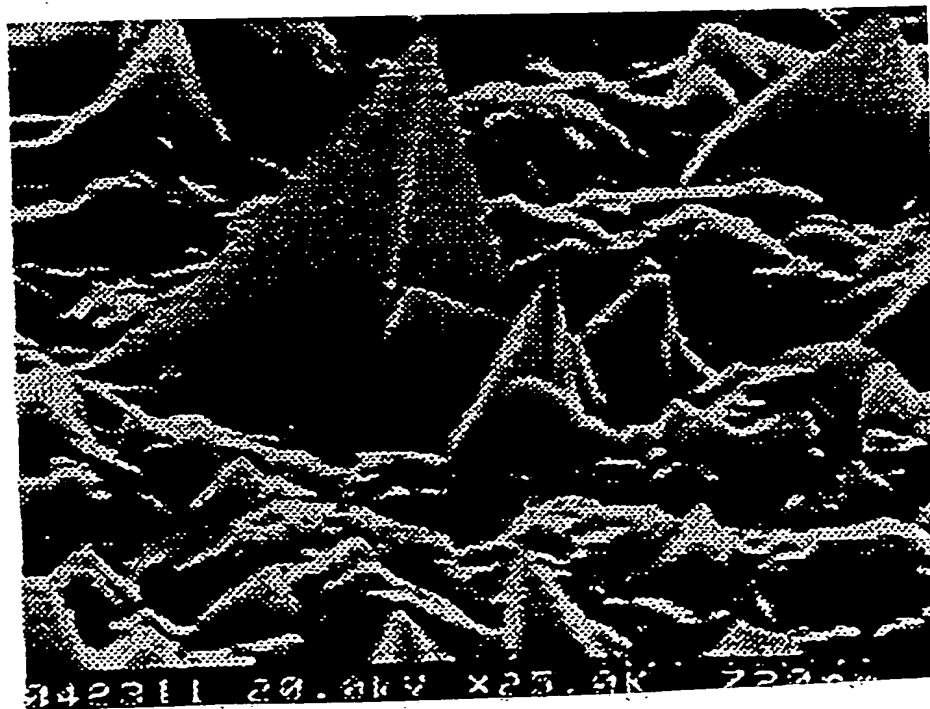
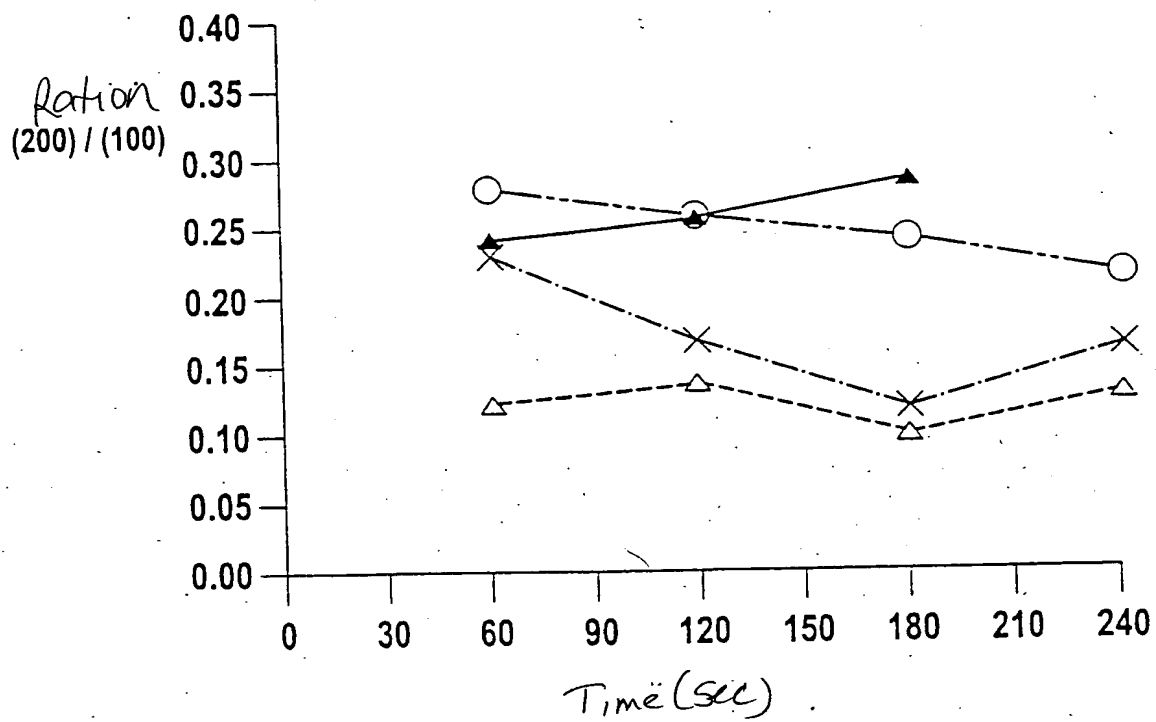


Fig. 24b



25 / 32

Fig. 25

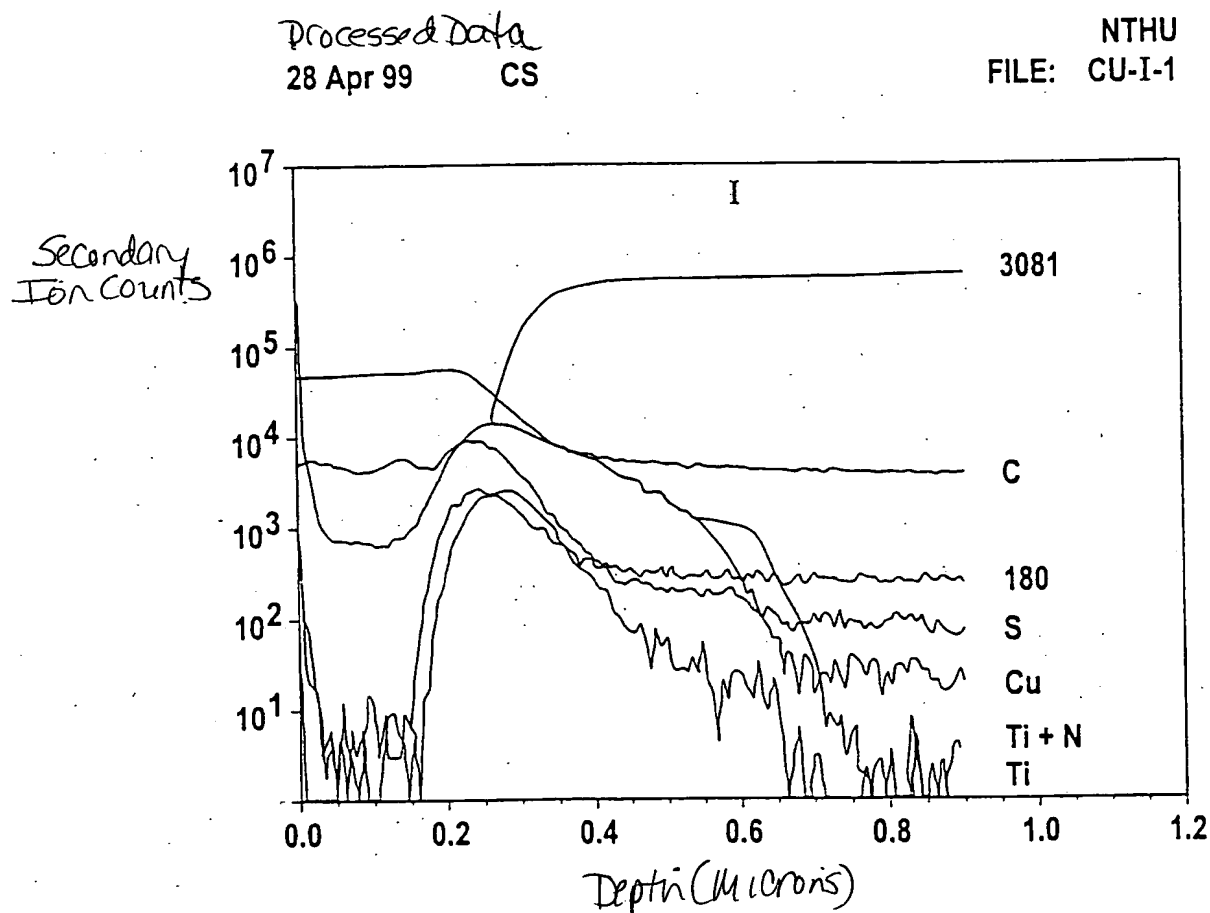


▲ S.T.D

△ (NH₂)₂CS₁ + PEG200× (NH₂)₂CS₁ + PEG1000○ (NH₂)₂CS₁ + PEG4000

26 / 32

Fig. 26a

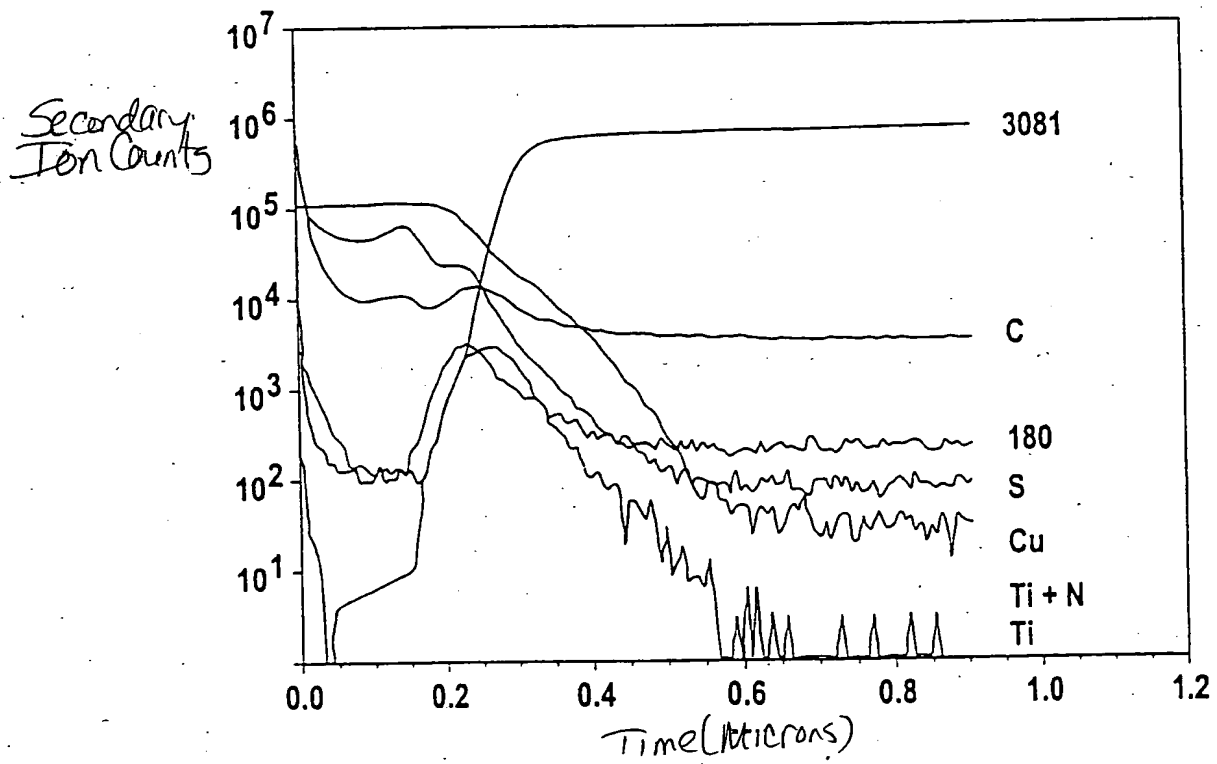


27 / 32

Fig. 26b

Processed Data
28 Apr 99 CS

NTHU
FILE: CU-I-2



28 / 32

Fig. 27

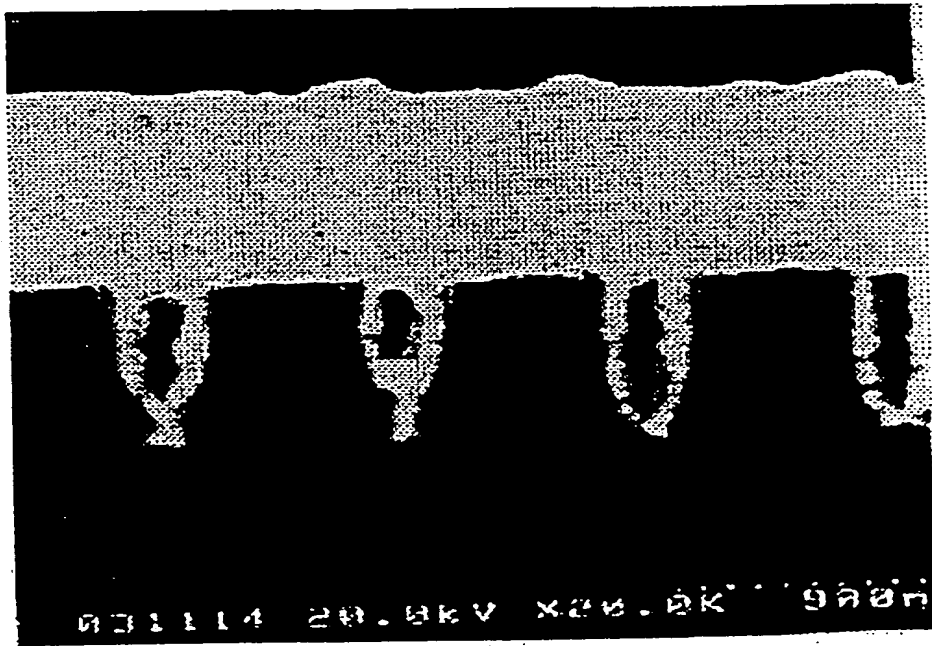


Fig. 28



29 / 32

Fig. 29a

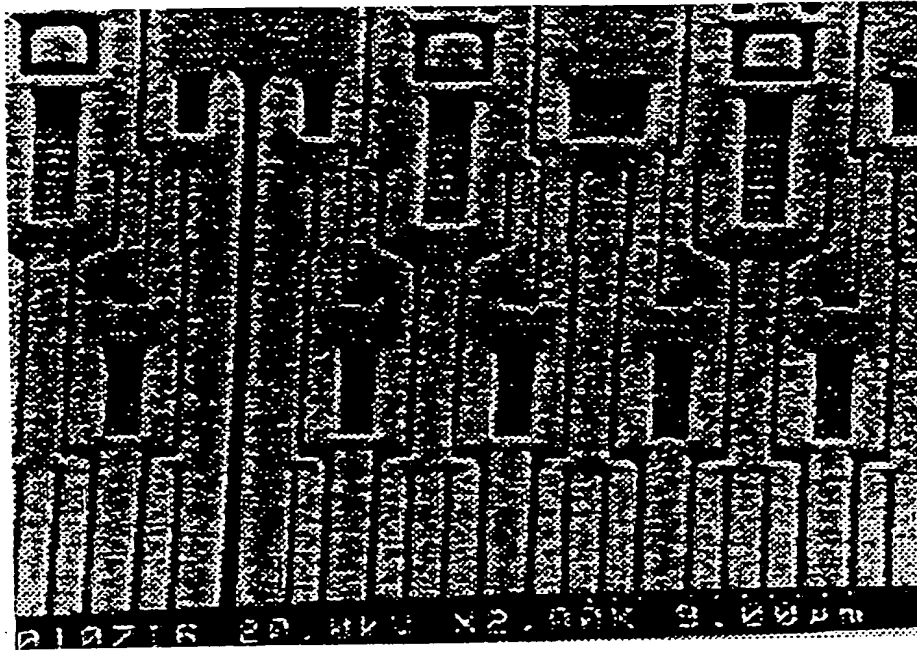
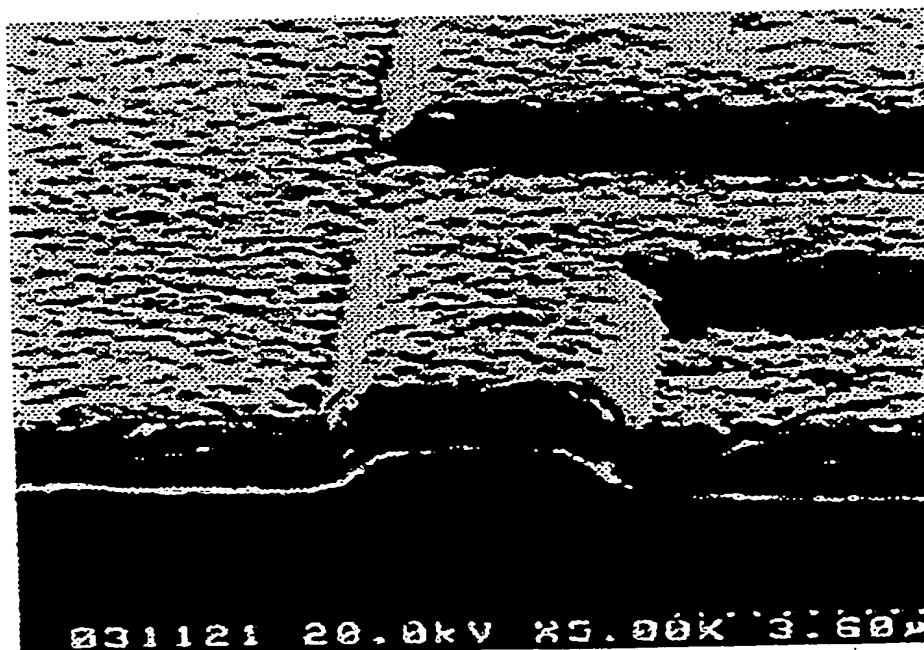
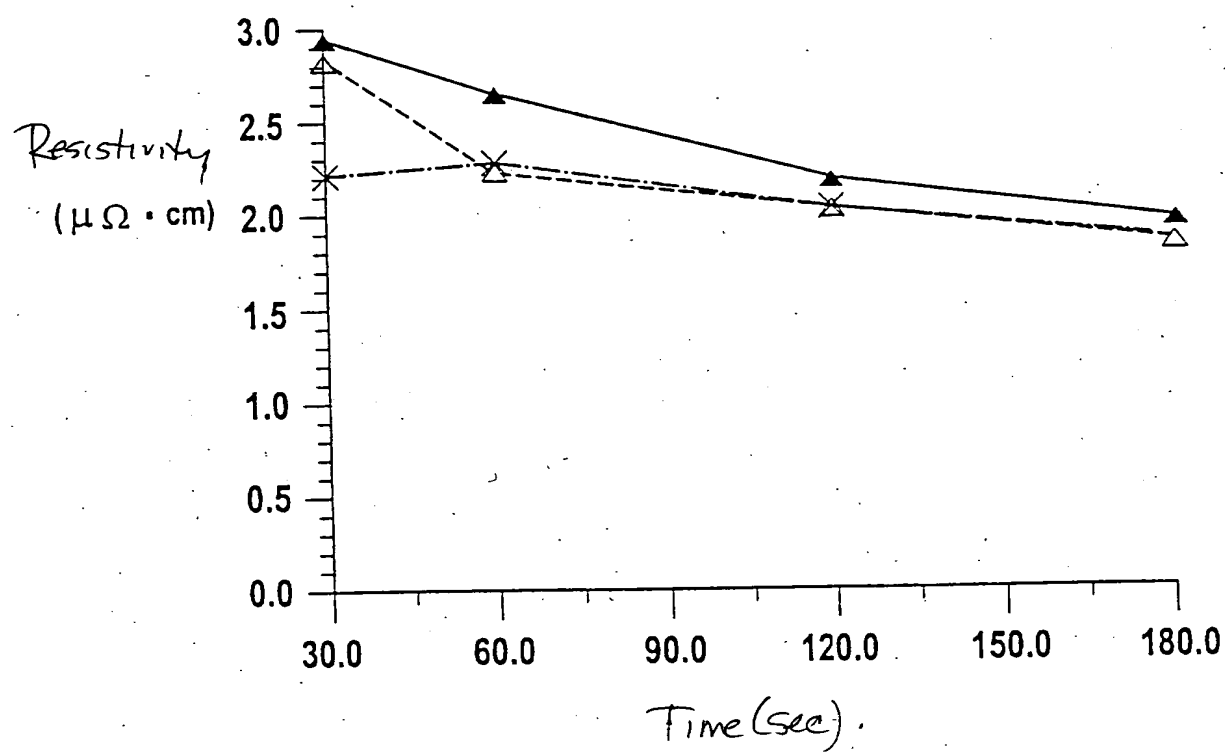


Fig. 29b



30 / 32

Fig. 30



- \blacktriangle without additive agent
- \triangle with $(\text{NH}_2\text{OH})_2 \cdot \text{H}_2\text{SO}_4$
- \times with $\text{NH}_2\text{OH} \cdot \text{HCl}$

31 / 32

Fig. 31

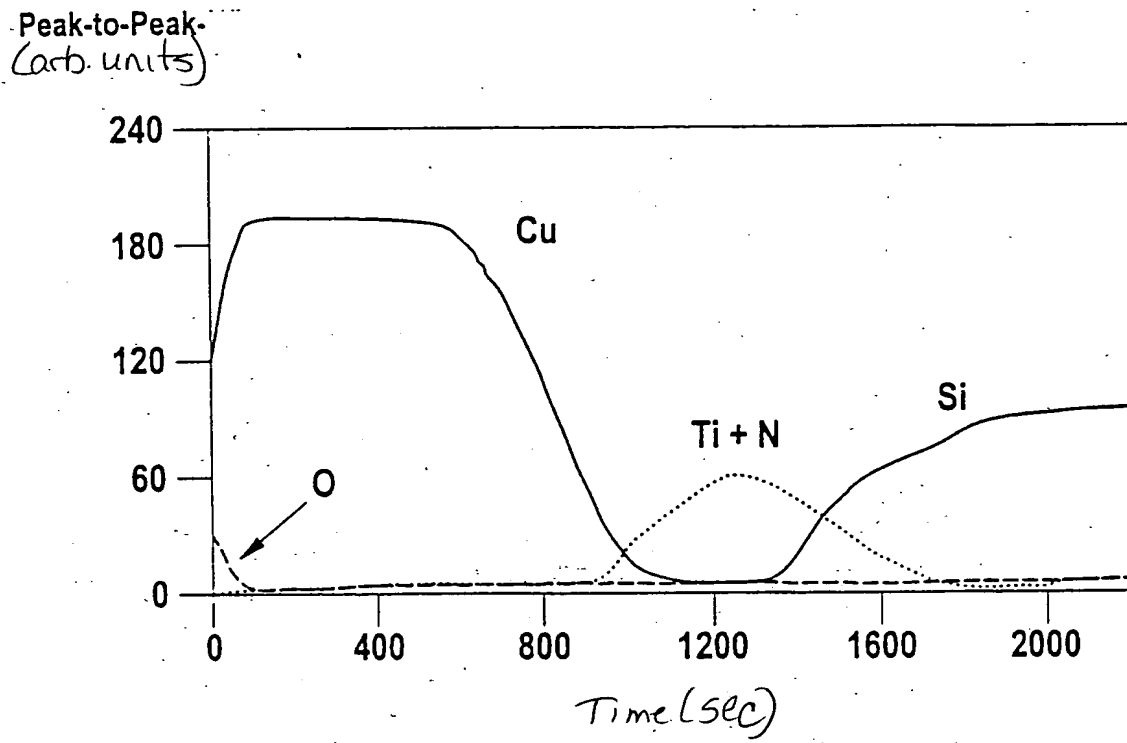




Fig. 32

